UTILIZATION OF MULTIWALLED CARBON NANOTUBE/POLY(p-PHENYLEME) COMPOSITE FOR GAS DETECTION

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One problems emerging in modern live is how to detect the exsistence of a gas in a room or space. The detection could be achieved by a sensor. The motivation of this work is to develop a sensor material consist of multiwalled carbon nanotubes(MWTNTs), polymers, and metal oxides. Recently the combination of CNTs and polymer or metal oxides gains serious attention since the CNTs have unique electrical properties.

Poly(p-phenylene) (PPP) is known as a potential conductive polymer due to the exsistance of double bond. Based on information in publisherd reports, the synthesizing of the PPP and the metal oxide successfully conducted. To observe comprehensively of materials synthesized,several characterization were conduction to get a kind of composite as a sensor material. Several variables such as sonication time, amount of dipersants, types of gas, and gas concentration were varied to investigate the performance of the composite.

A certain ratio of MWNTs with nominal size of 20 nm and synthesized-PPP was compounded with the presence of terpineol as a dispersant. To investigate an optimal condition for homogenizing all constituents, ultrasonication with 750 watts was employed with compounding time of 3, 10, 20, 30 min. It was found that the composite film could be prepared with ultrasonication within 10 minutes. The ratio of constituens and dispersants was also conducted. The composite was put into a system of sensing by wich the response of the sensor material recorded automatically every second. Avery important conclusion of this study is that the combination of MWNTs and PPP and tungsten oxide could be used as a sensor material. Typical results show that sensitivity of MWNTs was more than 40%.11-15% for MWNT/WO_3, and 12-30% for MWNT/PPP/$W0_3$.